

Lighting Up the Green Future

Target Green Network Evolution

Kostas Kompocholis
Senior Marketing Manager

CEE&Nordic European Marketing Dept





Contents



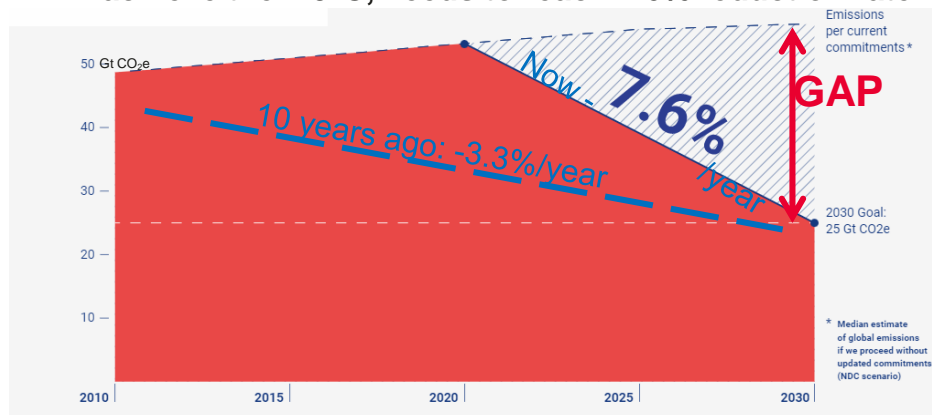
**Insights into Green
Developments**

Huawei's Green
Development Solutions

CO2e Reduction Becomes Urgent due to Climate & Energy Crisis

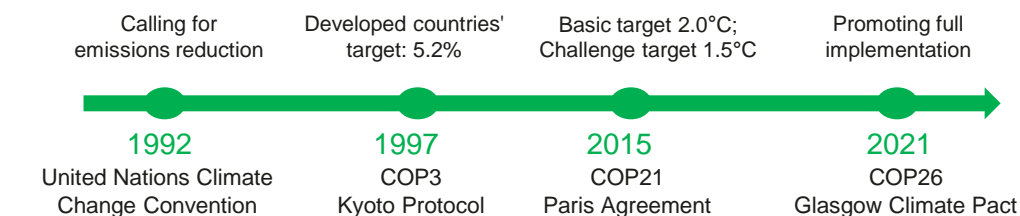
1.5°C is critical, global accelerated CO2e reduction action

To achieve the 1.5°C, needs to reach 7.6% reduction rate



Source: UN environment program

2021 COP26: Reaffirmed 1.5°C target on Glasgow

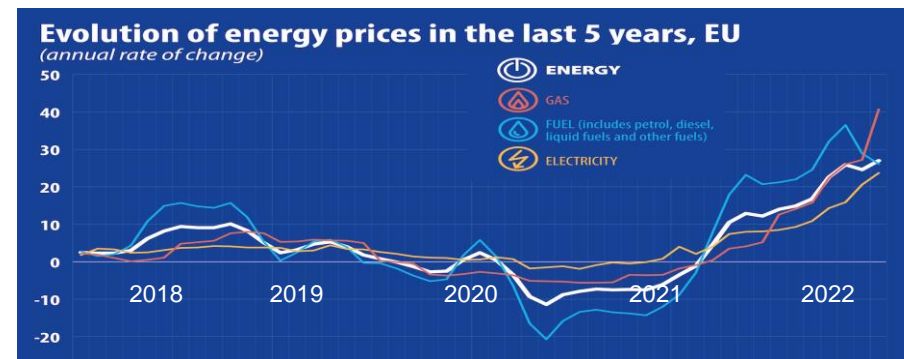


- **New net zero commitment:** 17 countries announced new net zero emission routes
- **Speeding up fossil fuel phase-out:** reduce coal, eliminating subsidies of fossil fuels
- **Green fund support:** 100B\$ climate financing is expected to be realized in 2023

Source: UN Climate Change

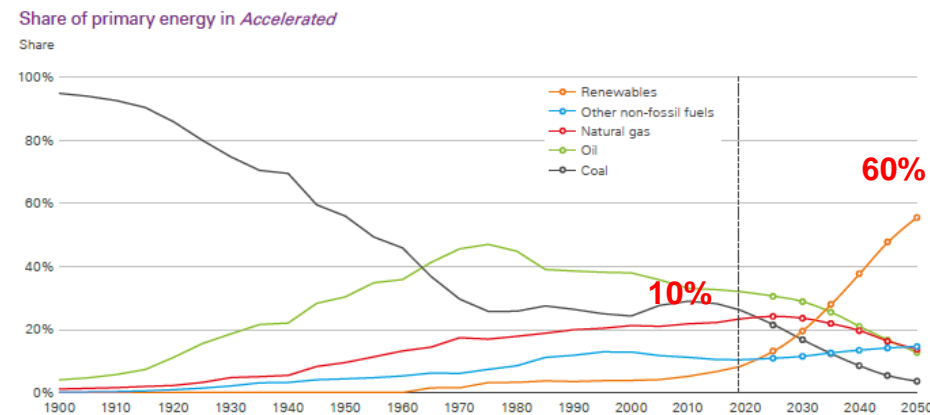
Energy crisis accelerates low-carbon transformation

In Europe, overall energy prices 27%↑ :
gas 41%↑, oil prices 26%↑, and electricity 24%↑



Source: Eurostat.com

Renewable energy share to increase from 10% to 60% by 2050



Source: BP energy outlook 2022

ICT Industry Initiatives and the Challenge of Balancing Network Development & Carbon Emissions

ICT set targets for emission reduction

ICT organizations jointly propose clear CO2e target guidance

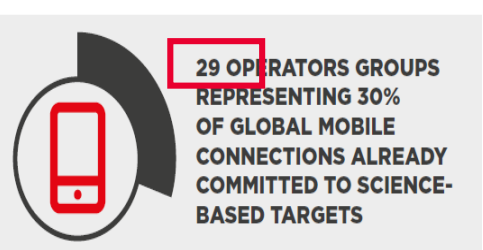


2020 → 2030
Carbon emission

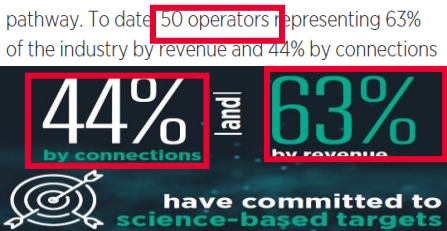
Mobile: 45% ↓
Fixed network: 62% ↓
DCs: 53% ↓

Source: ITU L.1470&GSMA Setting Climate Targets

50 carriers, representing 44% of connections & 63% of revenue commit to SBTi.



2020 GSMA report

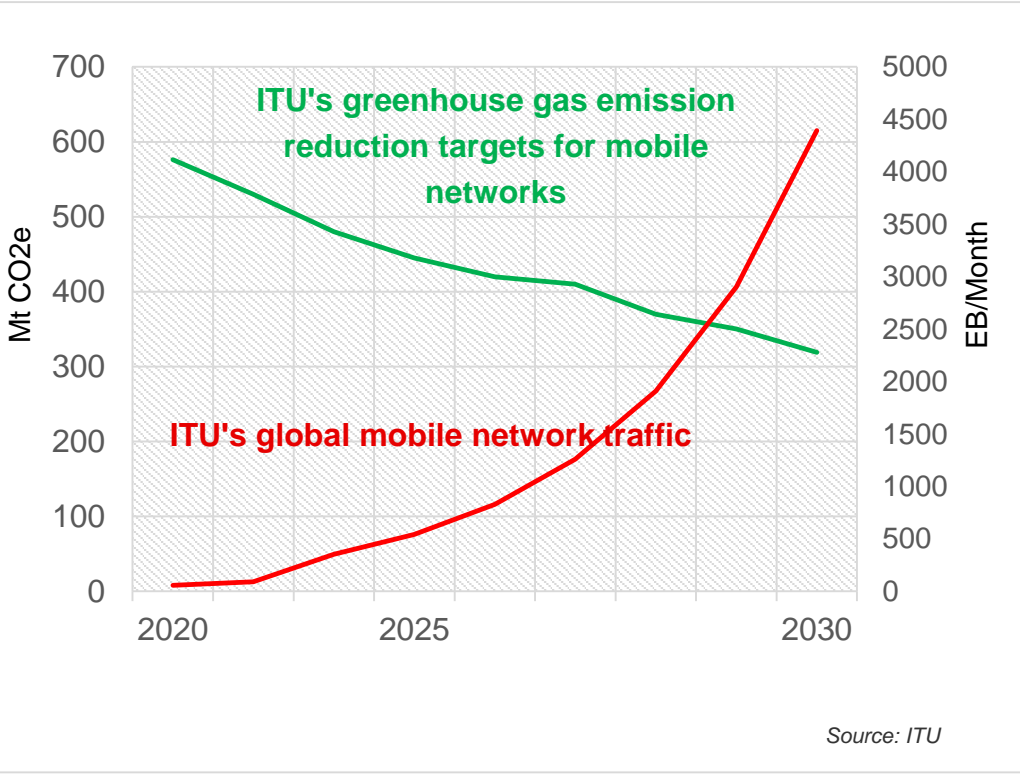


2022 GSMA report

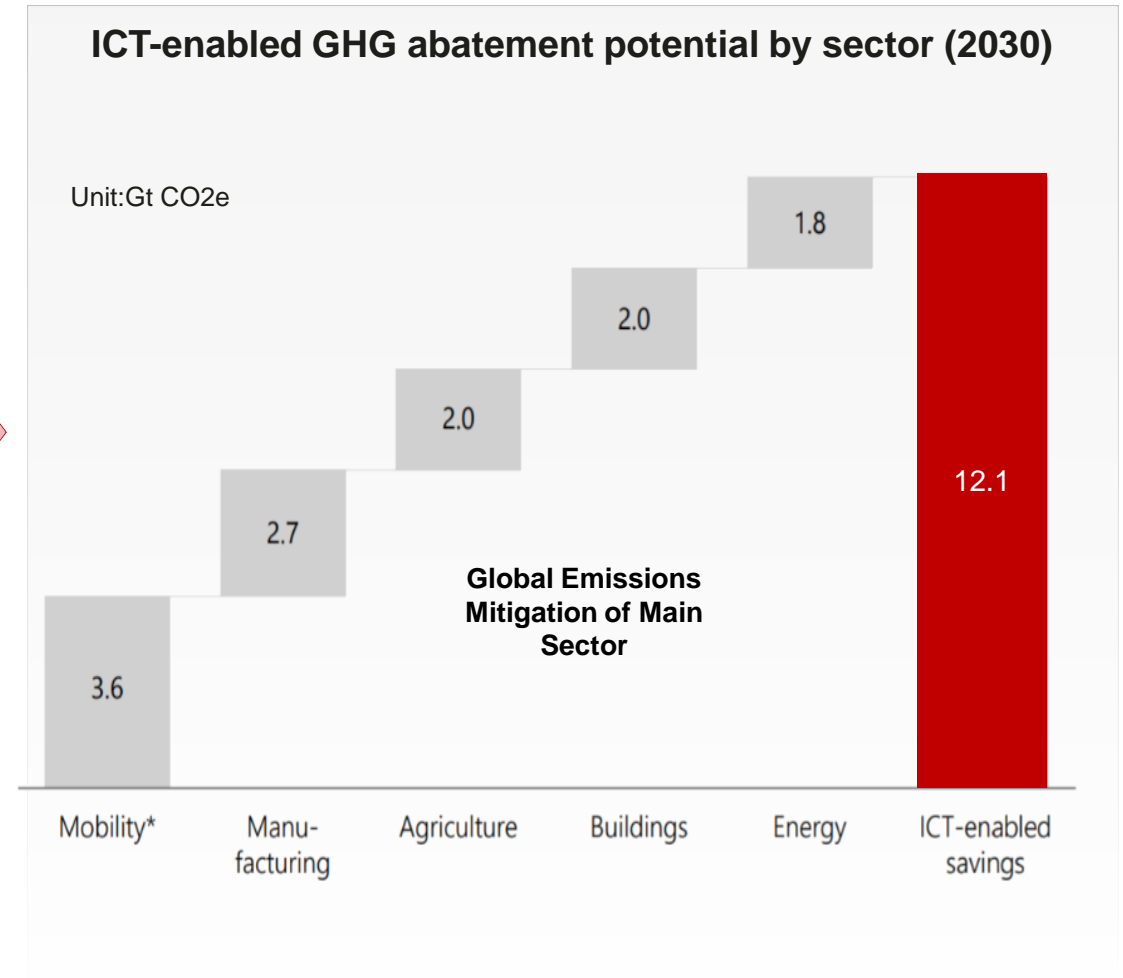
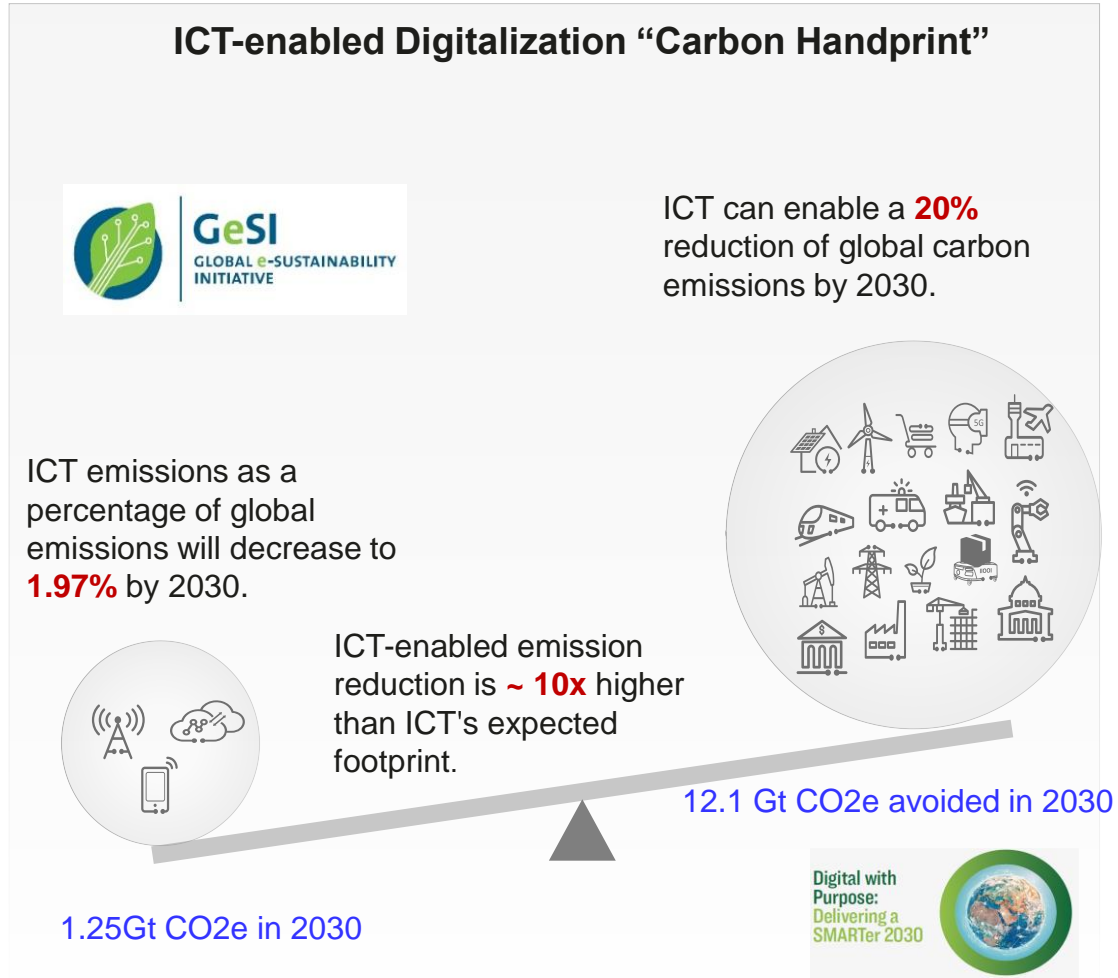
Source: GSMA Mobile Net Zero State of Industry report

Balancing 'Green' and 'Development'

Network development VS Carbon reduction

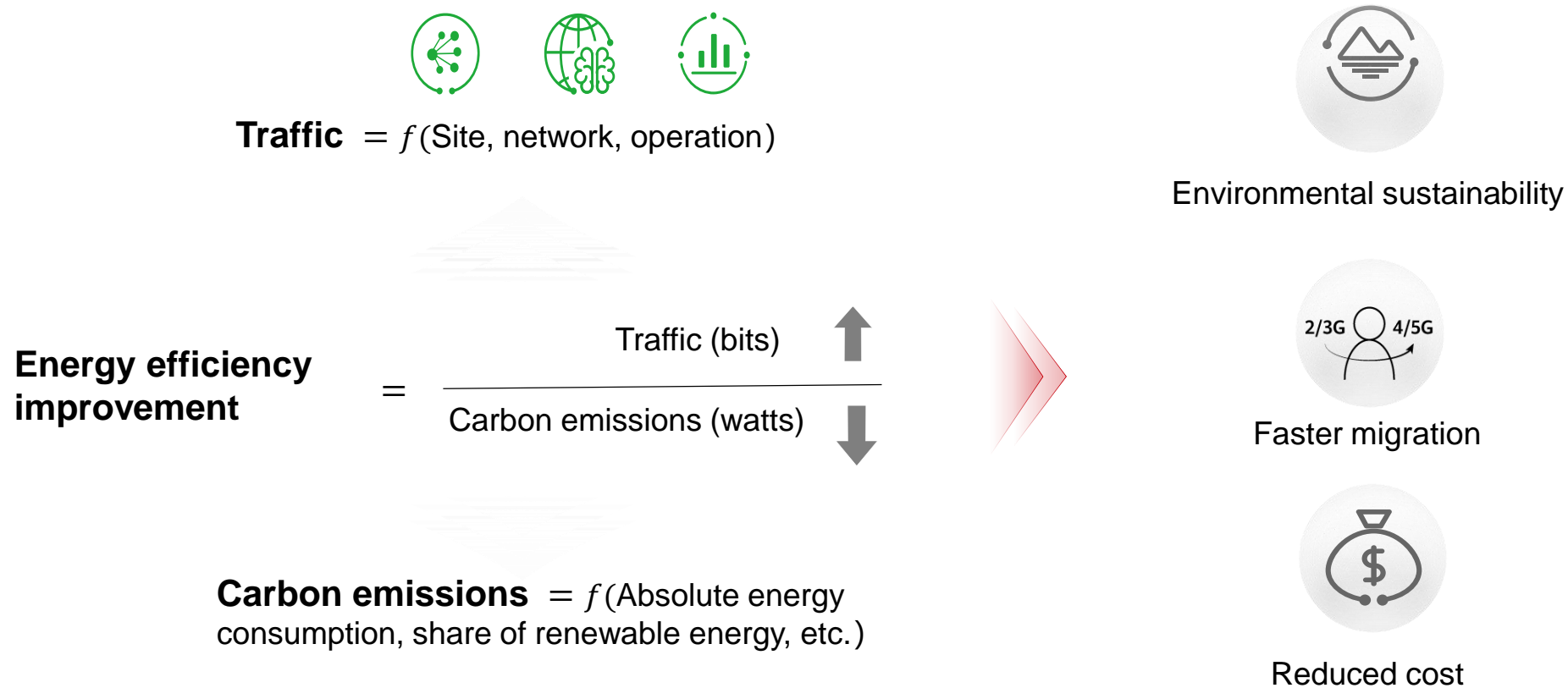


ICT Industry Will Enable Other Sectors to Reduce their Carbon Emissions




Source: WRI, IPCC, World Bank, GeSI, Accenture analysis & CO₂ models

Energy Efficiency is The “First Fuel” for Operators





Contents



Insights into Green
Developments

**Huawei's Green
Development Solution**

Improving Network Energy Efficiency with Green Development Solutions



Green Network

Modernization, High Integration, Intelligent

- 1 • **Green Hardware Solution:** Ultra-wide Band & Multi-Antenna
- 2 • **Intelligent Software Coordination:** 3 Dimensions of energy saving – Time/Breadth/Depth



Green Site

All Outdoor, RE on Site, Green Antennas

- 3 • **High Efficient Site:** Room->Cabinet->Pole, Power Staggering
- 4 • **Green Energy:** iSolar Site
- 5 • **Green Antenna with SDIF:** Green Antenna Based SDIF Technologies



Green Operation

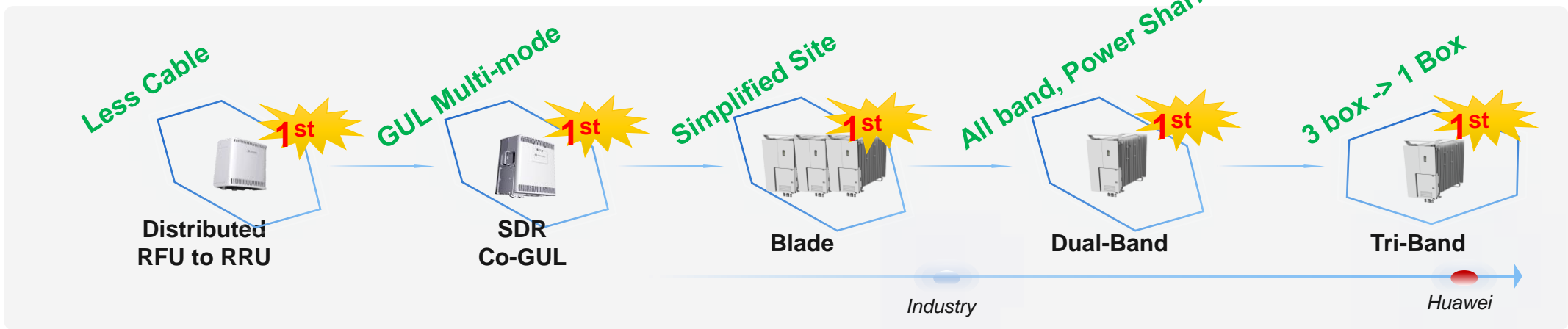
User & Network Operation

- 6 • **User Migration:** Migrate from 4G to 5G, 2G/3G Sunset

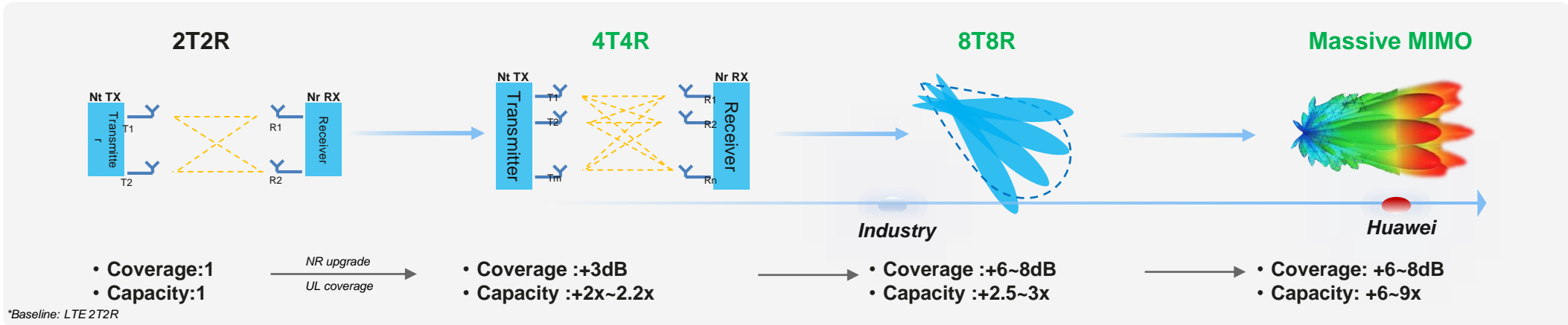
1

Ultra-wide Band & Multi-Antenna - Evolution Trend of Energy Efficiency and Performance

Ultra-Wide Band, High Efficiency of Bit/Watt



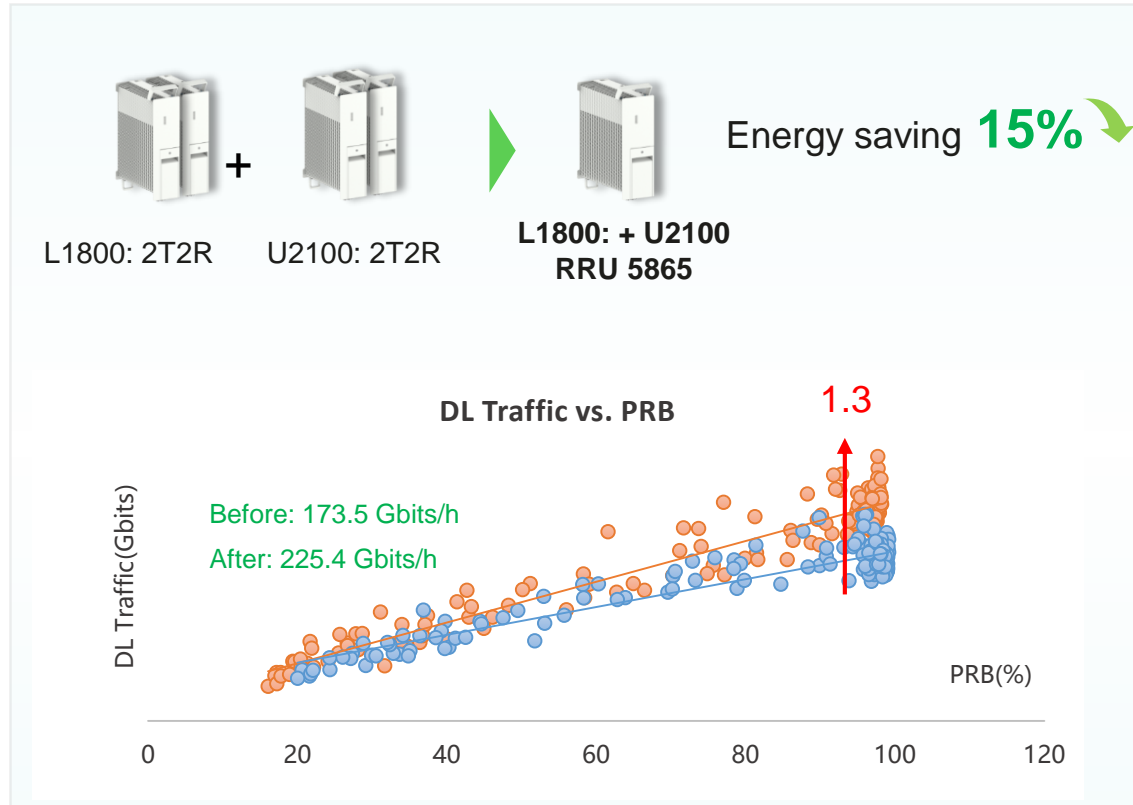
Multi Antenna, Maximize Spectrum Value



1 Modernize Legacy Equipment, ~15% Less Watts for More Frequency Bands

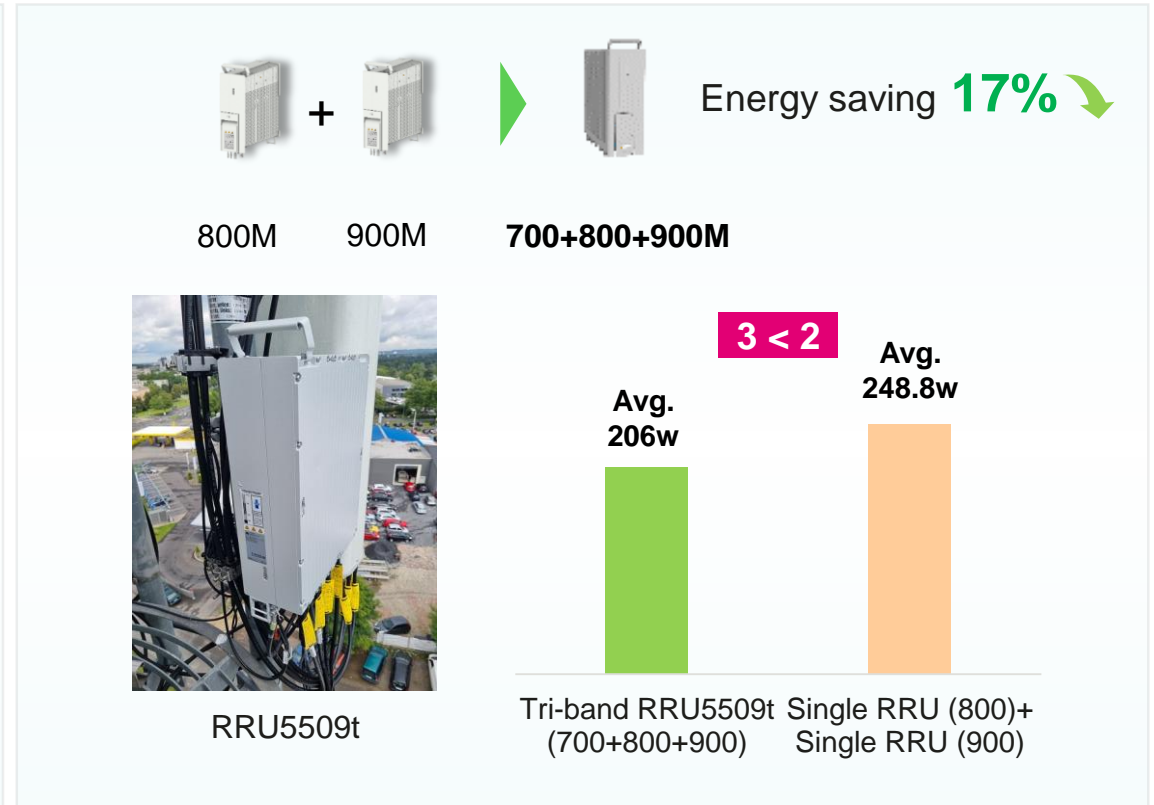
FDD 8T8R in Romania

Energy Saved **15%**, Capacity Increased **30%**



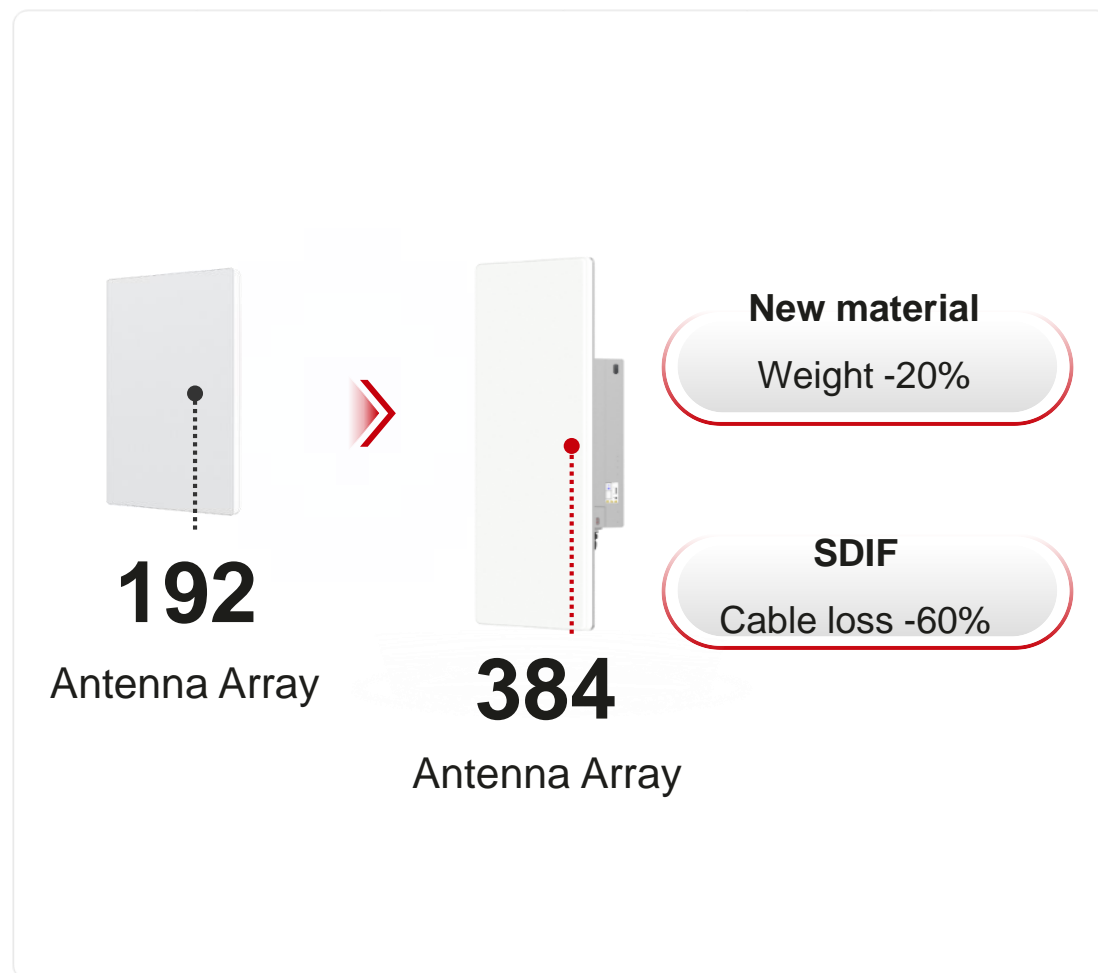
Triple Low-band 4T4R in DT EU Natcos

Energy Saving **17%** in Live Network

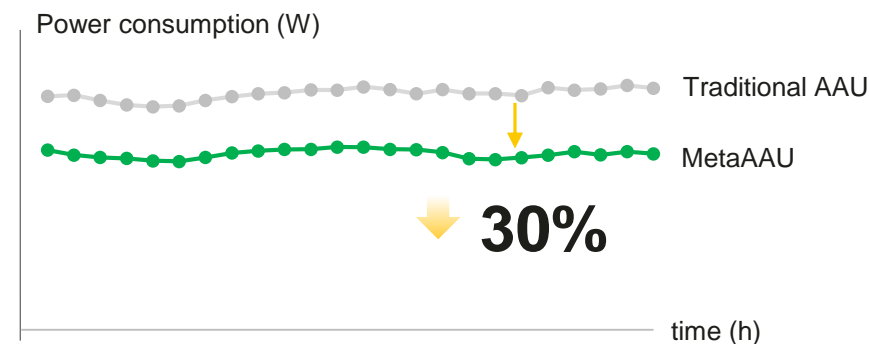
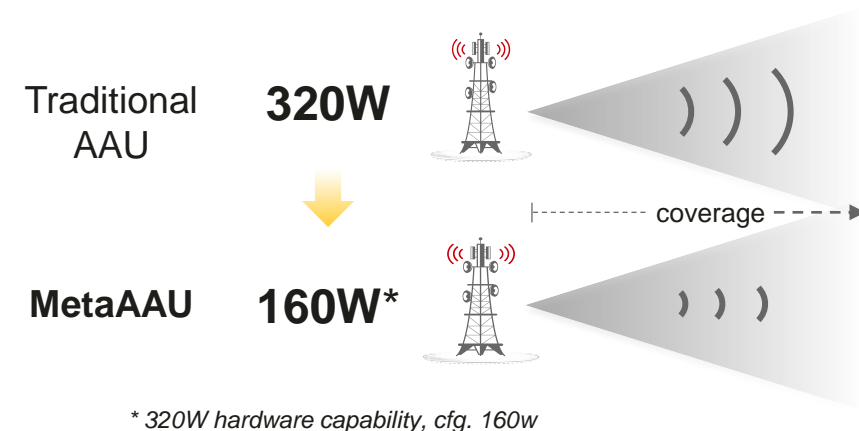


1 Industry Leading Massive MIMO, Reducing Power Consumption by 30%

MetaAAU with ELAA, New Direction of M-MIMO



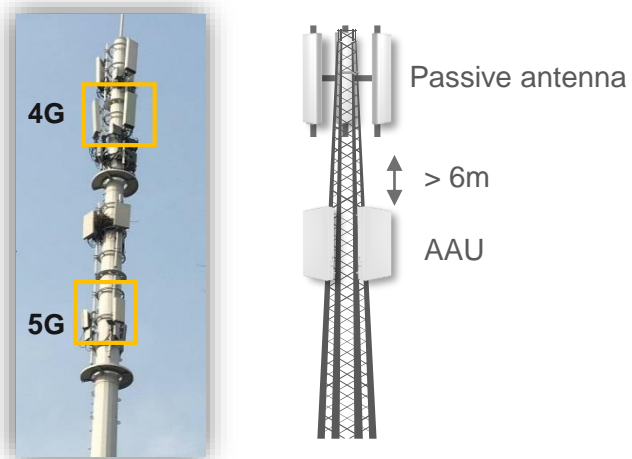
Same DL Coverage, Energy Consumption -30%



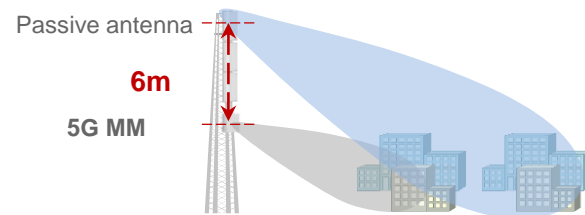
Testing Result of MetaAAU - Operator O in Country R

1 BladeAAU Pro: 6m Higher Position for C-band MM, Energy Saved by 17.6%

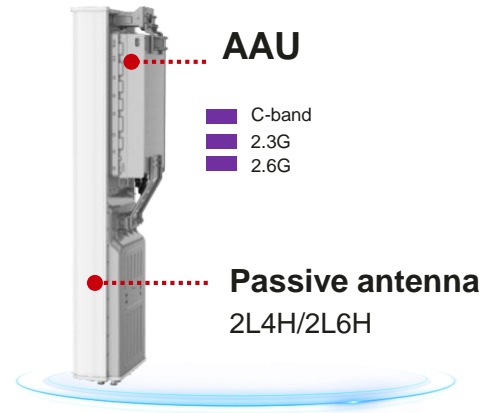
6m Lower Position, 20% Less Coverage



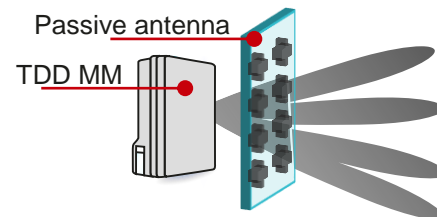
20% less coverage for 5G MM



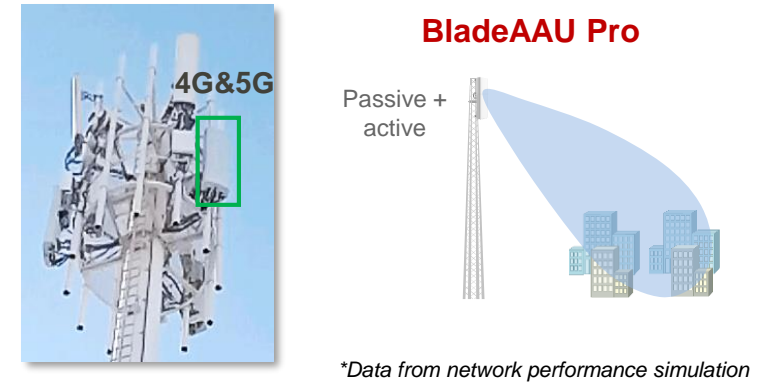
Same Height for 4G and 5G with BladeAAU Pro



Innovative materials, C-band MM penetration without loss

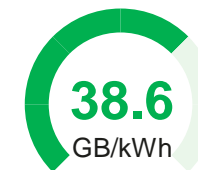


5G MM Installed 6m Higher

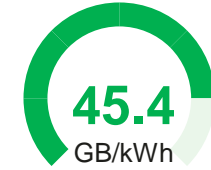


Energy Saving by 17.6%

Passive antenna + AAU



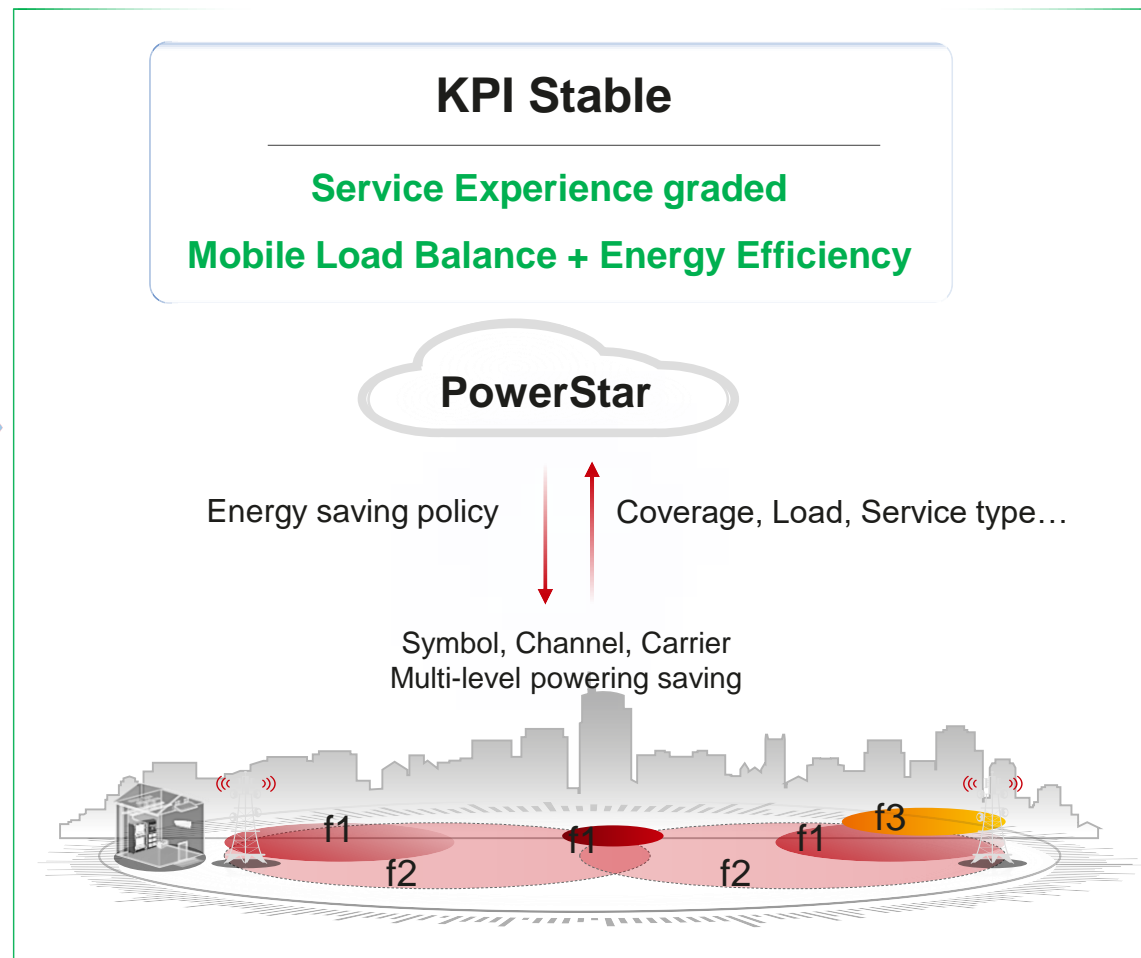
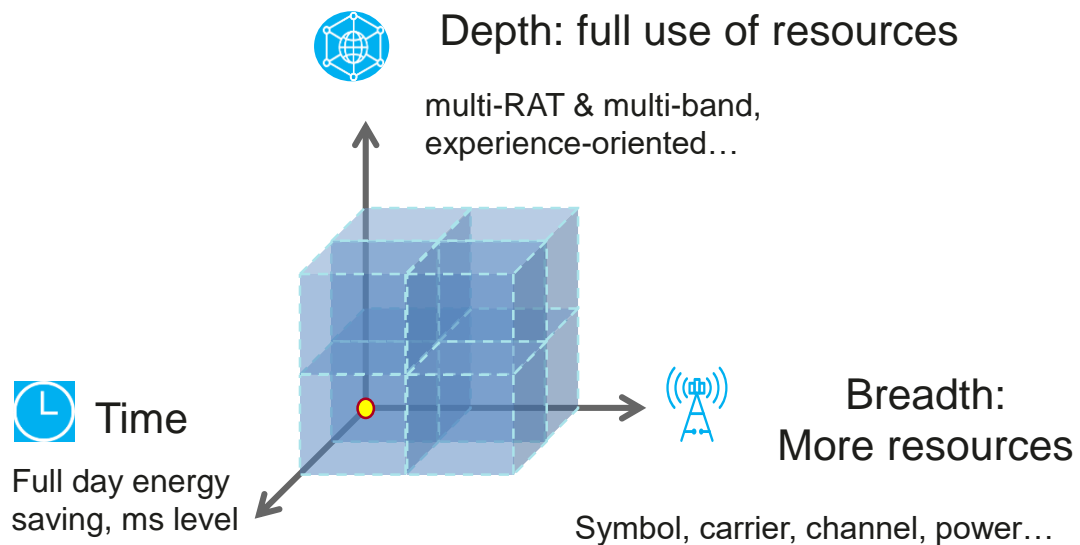
BladeAAU Pro



Source: Huawei MI; Assumption, 50% PRB load

2 Software Solution Improves Energy Efficiency with 3-Dimension Principle

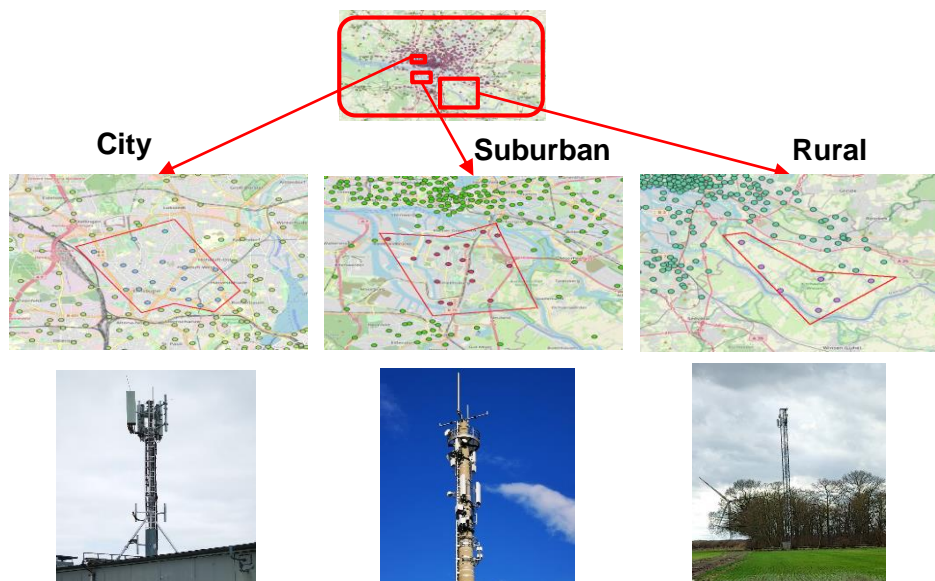
3-Dimension Principle for Energy Efficiency Improvement



2 12% Energy Saving Enabled by Huawei PowerStar Solution



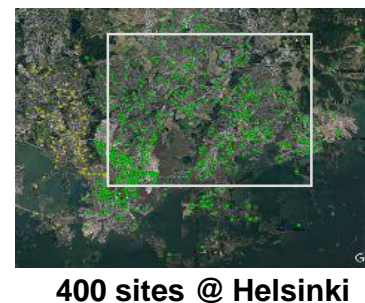
7.2% Energy Saving in Operator D with Static Configuration



- Verified through **38** typical sites in Hamburg
- Additional **7.2%** power saving with stable KPI



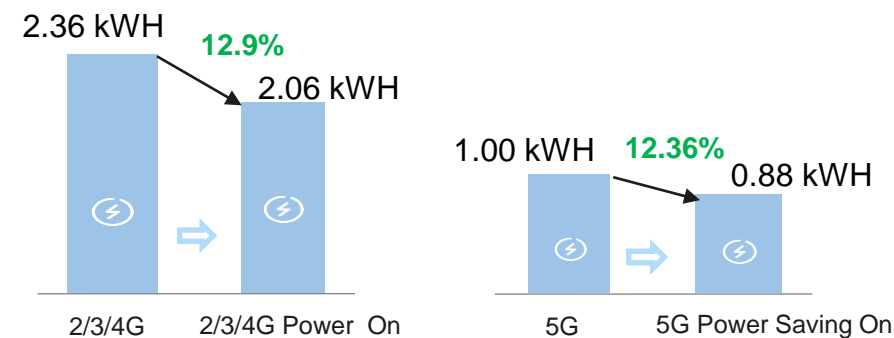
12% Energy Saving for Operator D with AI Based PowerStar Solution



Powerstar AI PoC Summary

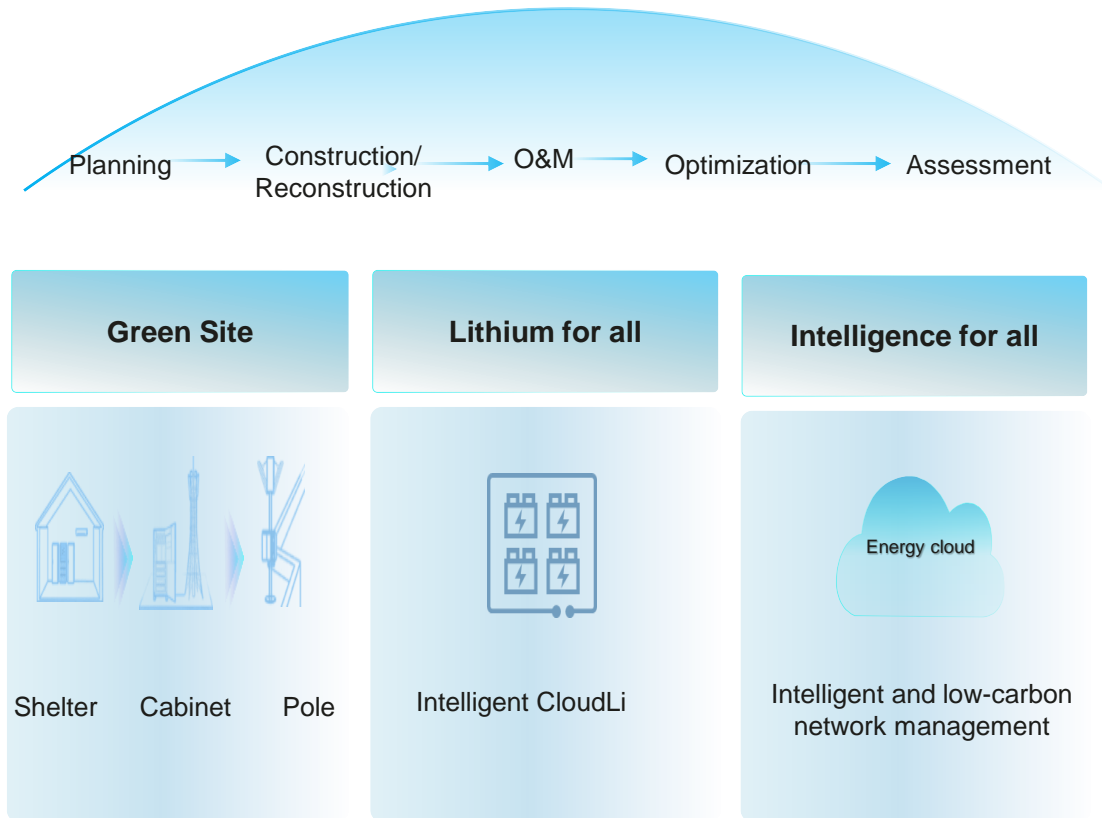
June, 2022

Power Saving **12%**



3 Green Site: Site Room -> Cabinet -> Pole to Save \$ 8,200/Site/Year, Peak Staggering via Huawei BoostLi to Save €530/Site/Year

Green Site for All Scenarios and Lifecycles



Poles to Replace Cabinets, Saving OPEX \$ 8,200/Site/Year @ China

Traditional Cabinet



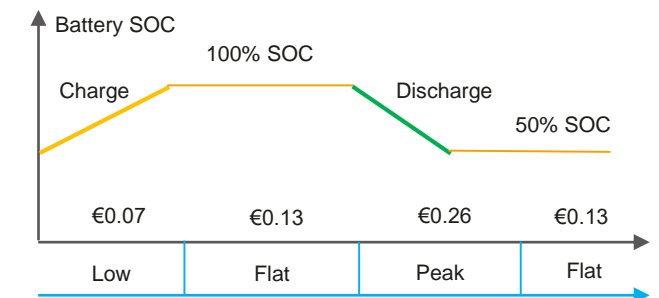
After reconstruction



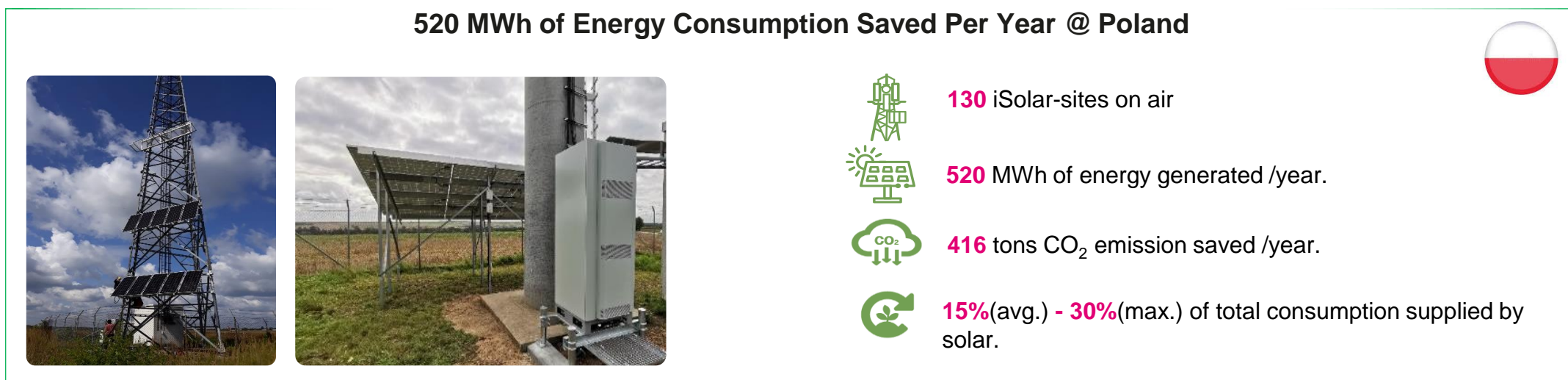
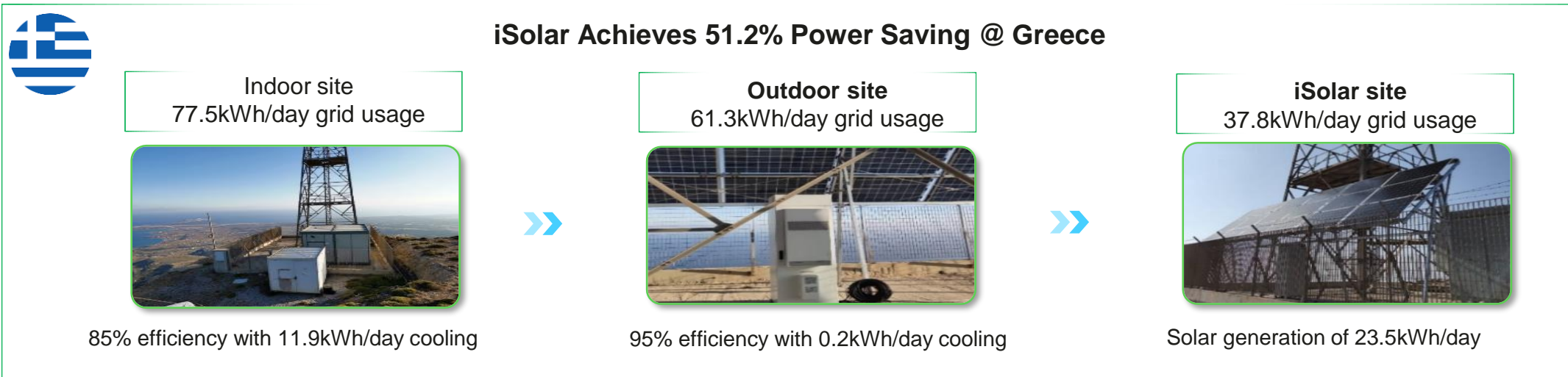
One blade one site

- Zero footprint, saving rent of **\$5,100/site/year**
- Free of cooling, high efficiency, saving electricity fees by **\$3,100/site/year**

CloudLi Peak Staggering Saves €530/Site/Year @ Portugal



4 To Introduce Solar Access, 15%~30% Energy Consumption Goes Green

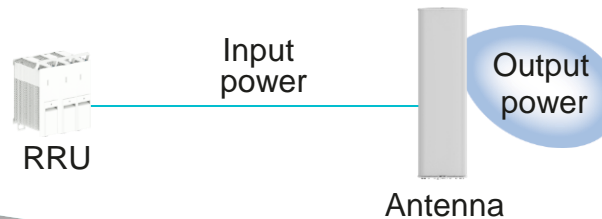


5 Green Antenna: A New Field for Energy Conservation

Antenna Efficiency

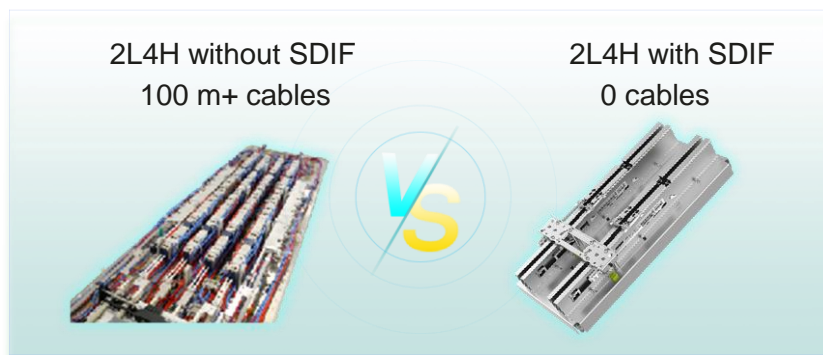
The Standard for Measuring Antenna Radiance

$$\text{Antenna Efficiency} = \frac{\text{Output Power}}{\text{Input Power}}$$



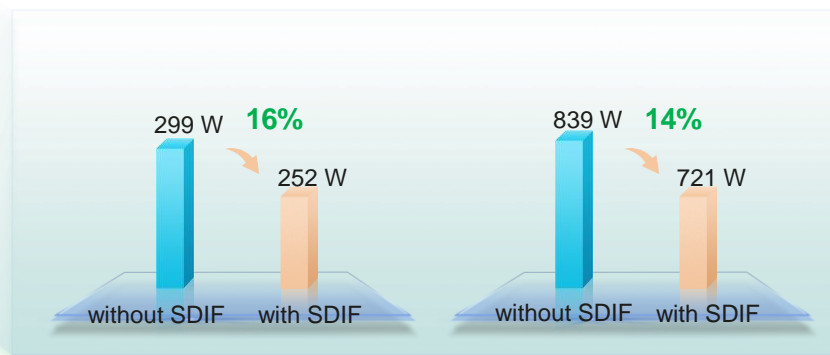
Signal Direct Injection Feeding (SDIF)

Key to Improving Antenna Efficiency



Higher Antenna Efficiency

Bigger Power Cost Savings



700 MHz 2×60 W RRU

1800 & 2100 MHz 4×80 W RRU

70% RRU load

5 Green Antenna Help Network to Reduce Power Consumption by ~15%

Green Antenna Efficiency

85%



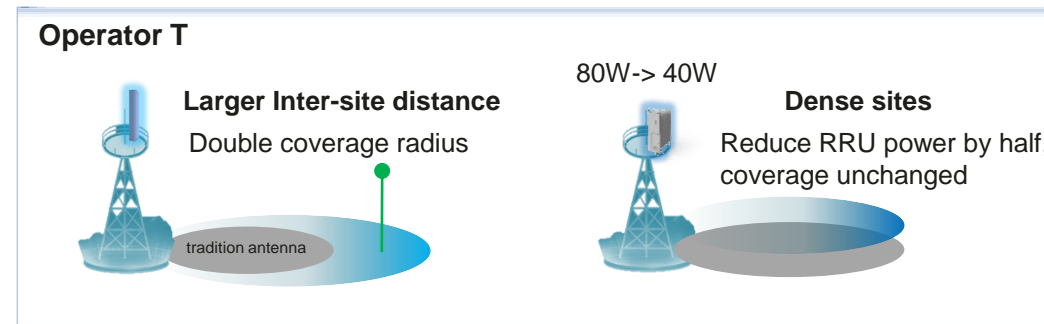
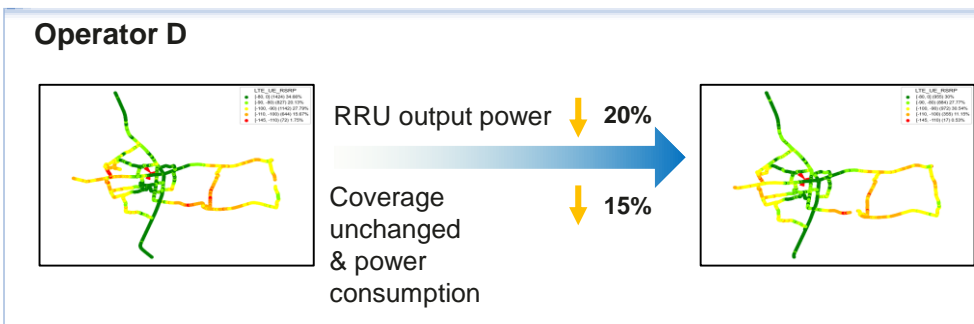
Traditional Antenna Efficiency

70%



Energy Conservation

~15%

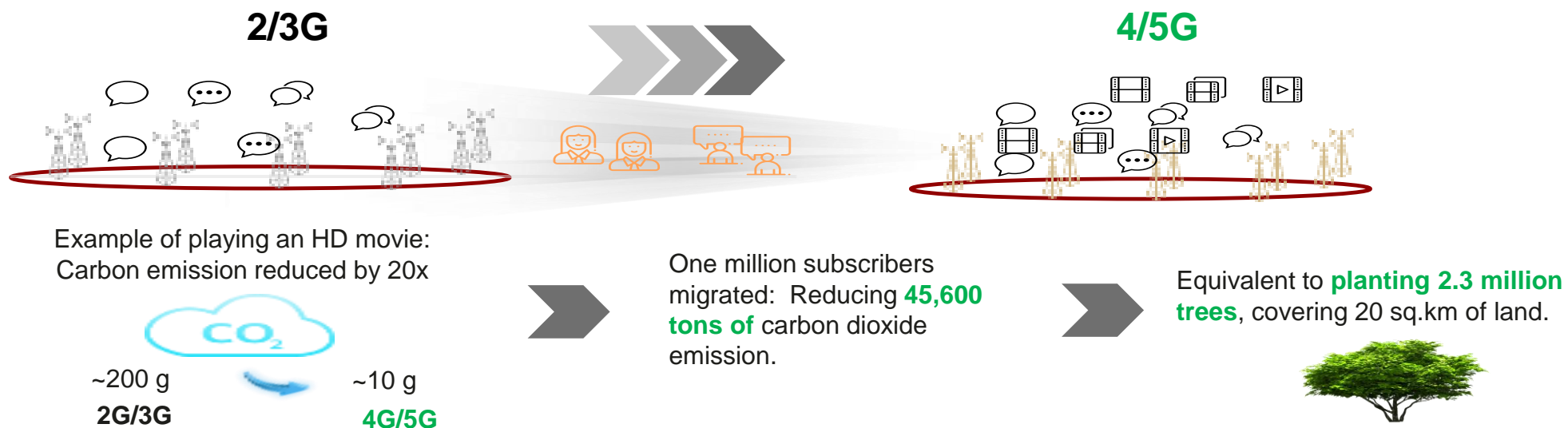


6 Improving Network Energy Efficiency with User Migration

4G/5G user migration improves energy efficiency by ~ 20x

Typical energy efficiency comparison between 4G and 5G

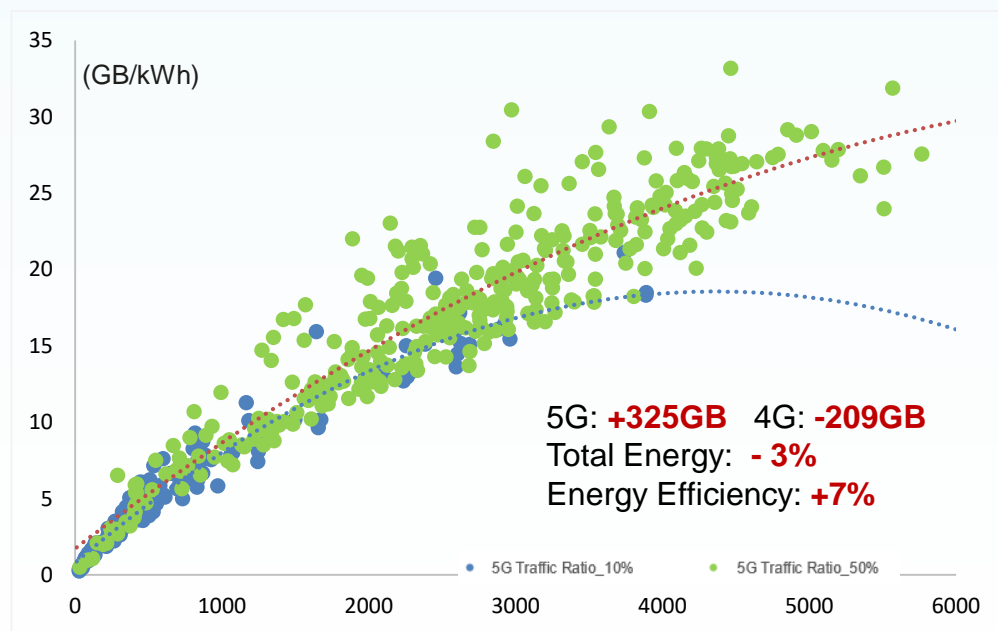
	4G (2T2R)	4G (4T4R)	5G (64T64R)
Typical Power Consumption (W)	370	500	800
Capacity (Mbps)	150	300	5,000 – 6,000
Bit Energy Efficiency	0.4Mbps/W	0.6Mbps/W	7.5Mbps/W



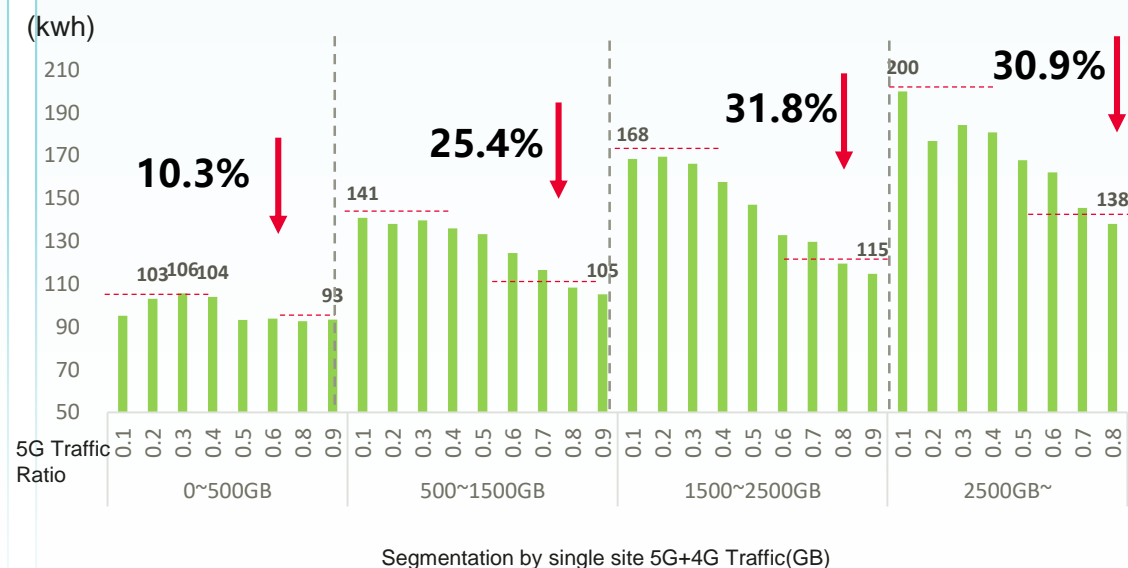
6 Higher 5G Traffic Ratio, Less Energy Consumption



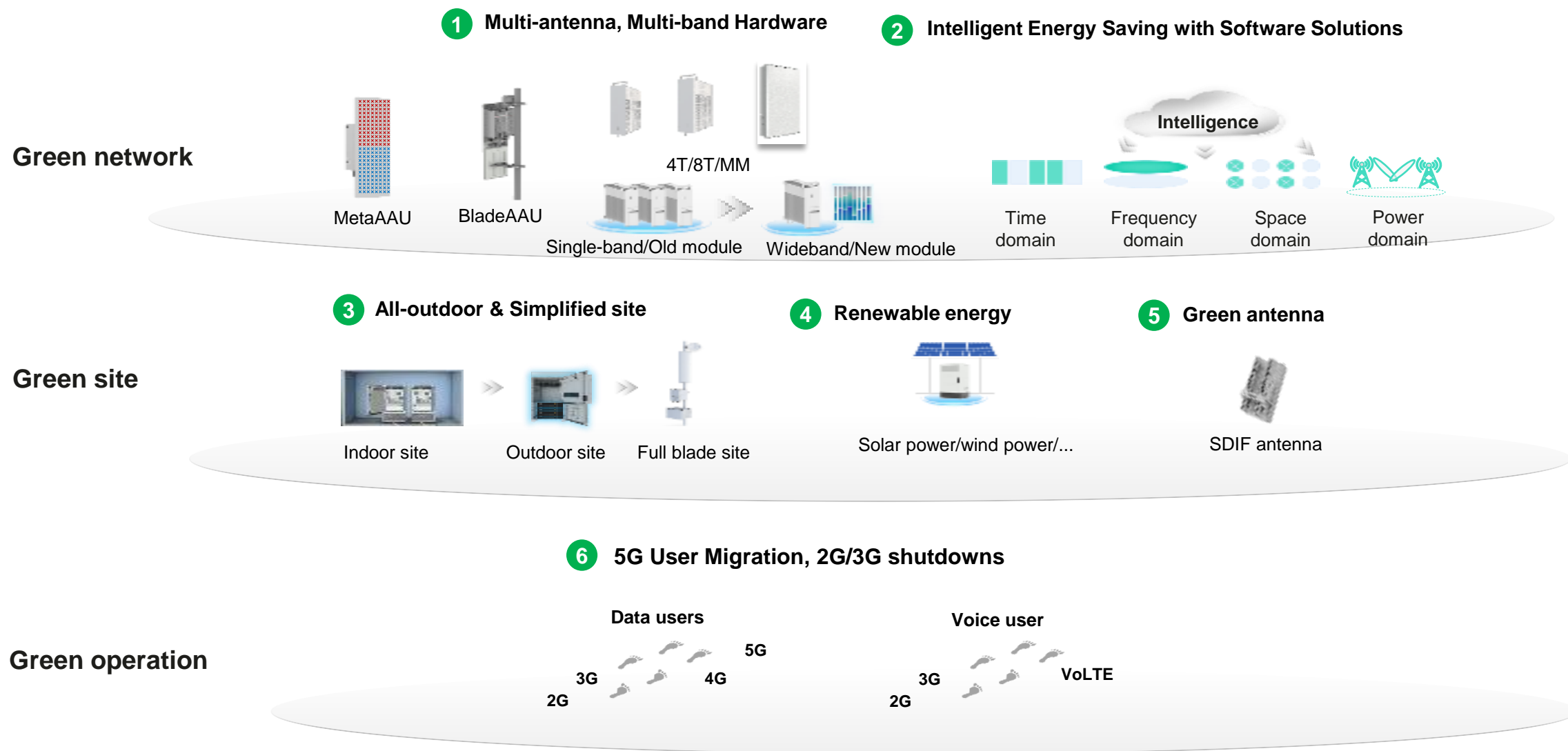
7% Energy Efficiency Increased When 5G Traffic Ratio increased from 10% to 50%



30% Energy Saved When 5G Traffic Ratio increased from 10% to 80%+



Summary: An Extensive “Toolbox” of Green Network Solutions



Thank you.

Bring digital to every person, home and organization for a fully connected, intelligent world.

**Copyright©2022 Huawei Technologies Co., Ltd.
All Rights Reserved.**

The information in this document may contain predictive statements including, without limitation, statements regarding the future financial and operating results, future product portfolio, new technology, etc. There are a number of factors that could cause actual results and developments to differ materially from those expressed or implied in the predictive statements. Therefore, such information is provided for reference purpose only and constitutes neither an offer nor an acceptance. Huawei may change the information at any time without notice.

